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Scuola Internazionale Superiore di Stud, i Avanzati, Via Beirut, 2-4, I-34014 Trieste (IT).

(21) International Application Number:  
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(74) Agents: **CAPASSO, Olga et al.**; Desimone & Partners S.p.A., Via V. Bellini, 20, I-00198 Roma (IT).

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(71) Applicant (*for all designated States except US*): **S.I.S.S.A. SCUOLA INTERNAZIONALE SUPERIORE DI STUDI AVANZATI [IT/IT]**; Via Beirut, 2-4, I-34014 Trieste (IT).

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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(75) Inventors/Applicants (*for US only*): **RUARO, Maria, Elisabetta [IT/IT]**; S.I.S.S.A. Scuola Internazionale Superiore di Stud, i Avanzati, Via Beirut, 2-4, I-34014 Trieste (IT). **BONIFAZI, Paolo [IT/IT]**; S.I.S.S.A. Scuola Internazionale Superiore di Stud, i Avanzati, Via Beirut, 2-4, I-34014 Trieste (IT). **TORRE, Vincent [IT/IT]**; S.I.S.S.A.

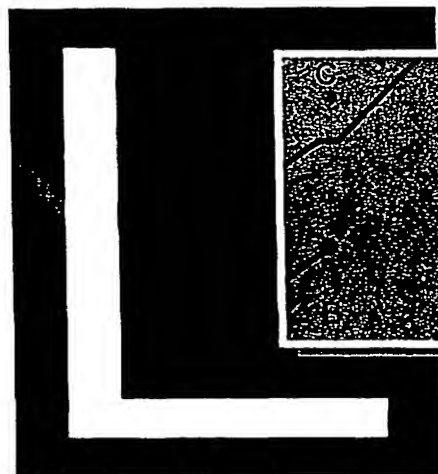
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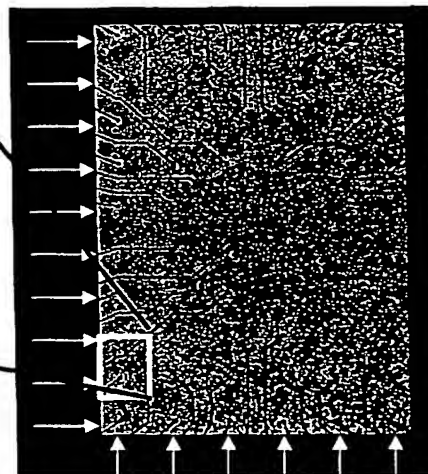
[Continued on next page]

(54) Title: **METHOD AND DEVICE FOR IMAGE PROCESSING AND LEARNING WITH NEURONAL CULTURES**

**A**



**B**



(57) Abstract: It is disclosed a device for image processing and learning comprising at least a "multi electrode array" (MEA), over which an homogeneous culture of interconnected neurons, so that forming a cell network, is grown on, wherein said MEA is able to stimulate and record the electric activity of said neurons. Methods for image processing and learning utilizing the device are disclosed too.

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According to International Patent Classification (IPC) or to both national classification and IPC

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 G06N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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PETRI DISH: A MICROFABRICATED INTERFACE TO  
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JOURNAL OF VACUUM SCIENCE AND TECHNOLOGY:  
PART B, AMERICAN INSTITUTE OF PHYSICS. NEW  
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1392-1398, XP000169149  
ISSN: 1071-1023  
A                    page 1392 - page 1398

1

## 2.6

**X** Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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- \*G\* document member of the same patent family

Date of the actual completion of the international search

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Name and mailing address of the ISA  
European Patent Office, P.B. 5818 Patentlaan 2  
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Fax (+31-70) 340-3018

Authorized officer

**Jacobs, P**

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/IT 03/00317

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	BUITENWEG J R ET AL: "FINITE ELEMENT MODELING OF THE NEURON-ELECTRODE CONTACT" November 2000 (2000-11), IEEE ENGINEERING IN MEDICINE AND BIOLOGY MAGAZINE, IEEE INC. NEW YORK, US, PAGE(S) 46-52 , XP000975448 ISSN: 0739-5175	1
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A	EP 1 104 911 A (UNIV CALIFORNIA) 6 June 2001 (2001-06-06)	

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International Application No  
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			EP	1104912 A2	06-06-2001
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			AT	208514 T	15-11-2001
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			WO	9506288 A2	02-03-1995
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(IT). BONIFAZI, Paolo [IT/IT]; S.I.S.S.A. Scuola Inter-  
nazionale Superiore di Stud, i Avanzati, Via Beirut, 2-4,

I-34014 Trieste (IT). TORRE, Vincent [IT/IT]; S.I.S.S.A.  
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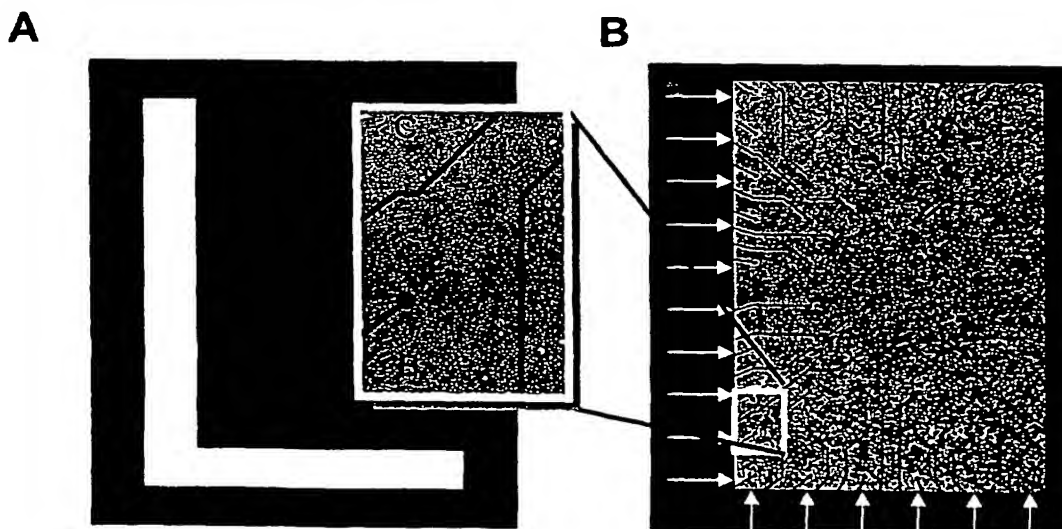
(81) Designated States (national): AE, AG, AL, AM, AT, AU,  
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,  
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,  
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,  
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,  
MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD,  
SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US,  
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Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,  
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,  
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,  
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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[Continued on next page]

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